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UNCOMPENSATED SO-16 LOW PRESSURE SENSOR

SM9D/SM9G SERIES

The low pressure SM9D/G series is available in pressure ranges of 0.15, 0.6 & 1.5 PSI full-scale in gauge and differential configurations. All parts in this series are uncompensated die mounted in a rugged plastic package designed for surface mounting. The surface mount small outline package (SO-16) is available horizontal and vertical configuration for differential pressure and in vertical configuration for gage pressure.

Features

- Uncompensated millivolt analog output
- Differential or gage pressure options
- Vertical or horizontal porting configurations
- Pressure ranges: 0.15, 0.6 & 1.5 PSI
- Variable supply voltage
- Built in ESD protection

Applications

- Patient Monitoring
- Wound Therapy
- Handheld Meters
- Pneumatic Gauges
- Pressure Switches
- Sports Equipment
- Appliances

1. Absolute Maximum Ratings

All parameters are specified at V_{DD} = 5.00 V DC SUPPLY at 25˚C, unless otherwise noted

Characteristic	Symbol	Min	Typ	Max	Units
Supply Voltage [a, c]	V_{DD}	-	-	6.5	V
Supply Current [a, c]	I_{VDD}	-	-	1.6	mA
Operating Temperature Range [b]	T_{OP}	-40	-	+85	°C
Storage Temperature [b]	T_{STG}	-40	-	+125	°C
ESD Voltage (HBM)	V_{ESD}	4	-	-	kV

Product	Operating Pressure	Proof Pressure (P_{PROOF}) [d, e]	Burst Pressure (P_{BURST}) [d, f]
SM9X-BXX-X-001S-000	0.15 PSI	1.5 PSI	3.0 PSI
SM9X-BXX-X-006S-000	0.6 PSI	4.8 PSI	6.0 PSI
SM9X-BXX-X-015S-000	1.5 PSI	12.0 PSI	15.0 PSI

2. Operating Characteristics Table

All parameters are specified at V_{DD} = 5.0 V DC SUPPLY at 25°C, unless otherwise noted.

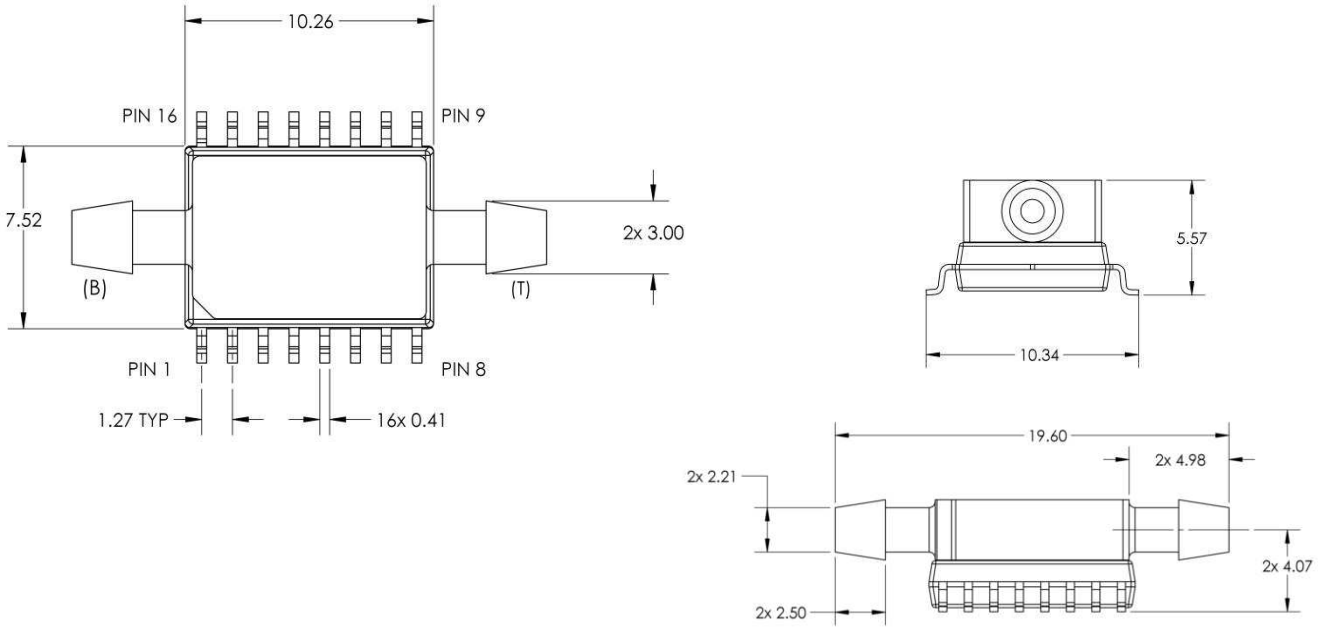
Characteristic	Symbol	Min	Typ	Max	Units
Span (0.15 PSI) (g)	V_{SPAN}	30	45	60	mV
Span (0.60, 1.5 PSI) (g)		50	90	120	
Zero Offset	V_{ZERO}	-55	0	+55	mV
TC Span [g, i, j]	TCS	-0.24	-0.21	-0.15	%FS/°C
TC Zero Offset [g, i, j]	TCZ		0 to +100		µV/°C
TC Resistance [h, i, j]	TCR	0.17	0.20	0.23	$\%R_B$/°C
Topside Linearity [g, j]	NL	-0.15	±0.1	0.15	%FS
Backside Linearity [g, j]		-0.35	±0.2	0.35	
Bridge Resistance	R_B	4.0	5.0	6.0	kΩ

Notes:

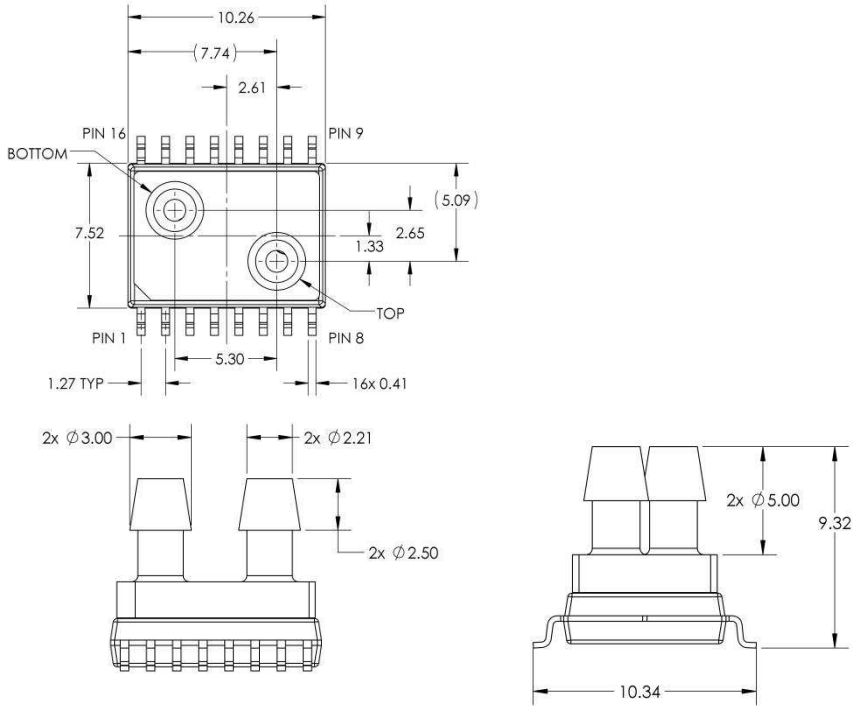
a) The device can only be driven with the supply voltage connected to the pins as shown. The positive output will increase with increasing pressure applied to the package.
b) Tested on a sample basis.
c) Never exceed 6.5 V supply voltage under any operating conditions.
d) Tested on a sample basis.
e) Proof pressure is defined as the maximum pressure to which the device can be taken and still perform within specifications after returning to the operating pressure range.
f) Burst pressure is the pressure at which the device suffers catastrophic failure resulting in pressure loss through the device.
g) Tested on a sample basis.
h) The device can only be driven with the supply voltage connected to the pins as shown.
i) Determined by measurements taken between -40°C and 85°C.
j) Defined as best fit straight line.

3. Diagrams & Dimensions

Dual Horizontal Porting Configuration: SM9D-BB



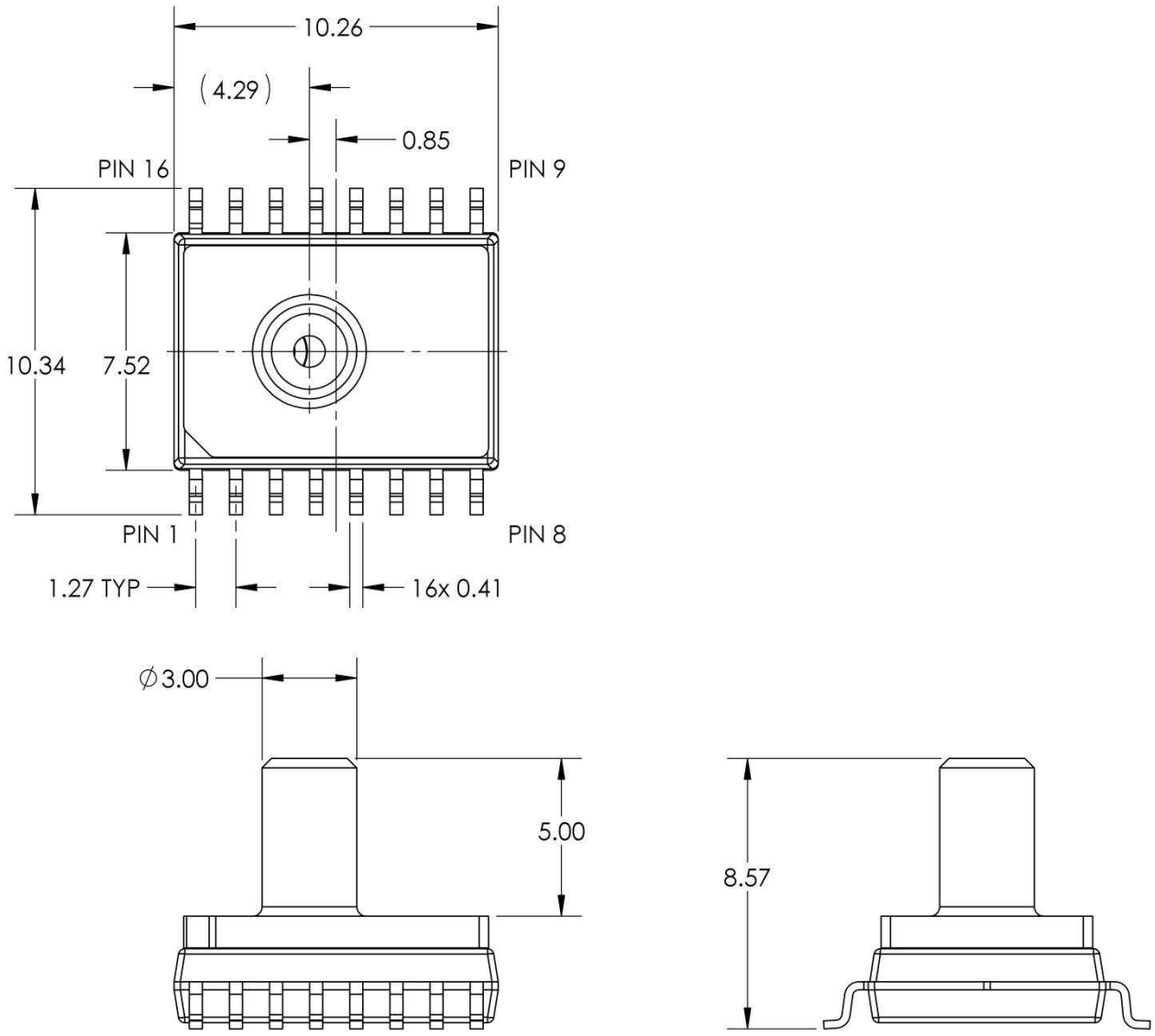
Dual Vertical Porting Configuration: SM9D-BC



Notes:

- All dimensions in units of [mm]
- Moisture Sensitivity Level (MSL): Level 3
- Positive pressure applied to the topside of the die [T] is resulting in a positive change in output.

Single Vertical Porting Configuration: SM9G-BG

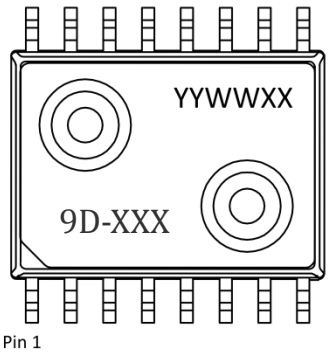


Notes:

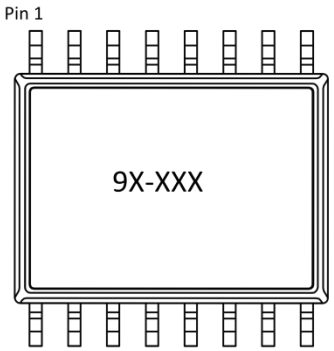
- All dimensions in units of [mm]
- Moisture Sensitivity Level (MSL): Level 3
- Positive pressure applied to the port is resulting in a positive change in output. Pressure is applied to the backside of the die

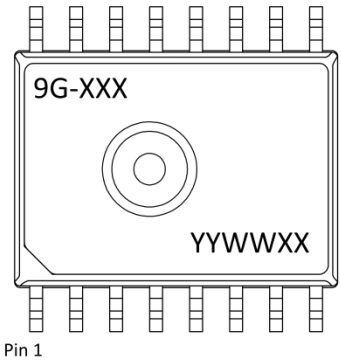
Part & Lot Number Identification

Top View

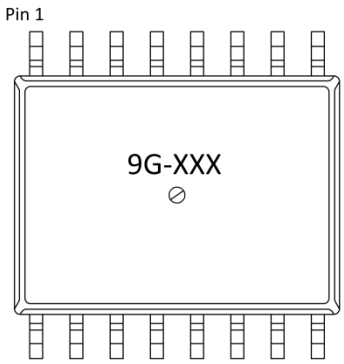


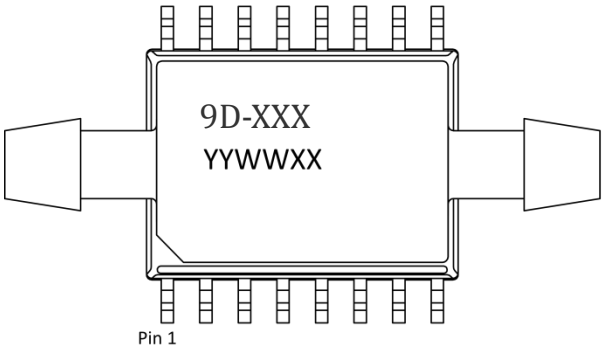
Bottom View

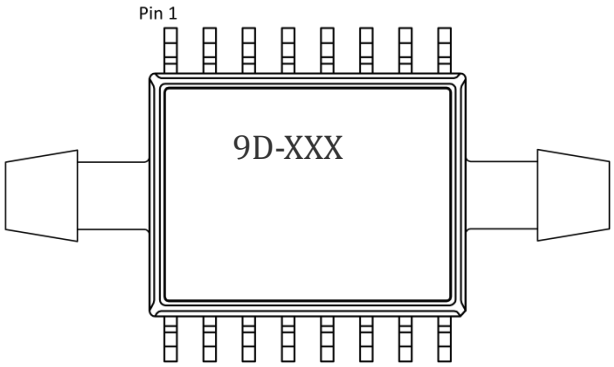




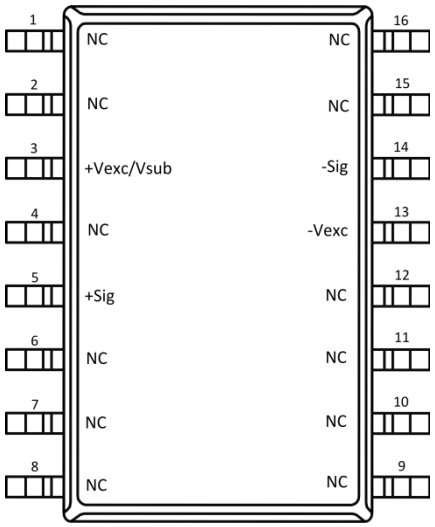
Only in Gage pressure







SM9D Package Pin-Out (Dual Horizontal & Dual Vertical)

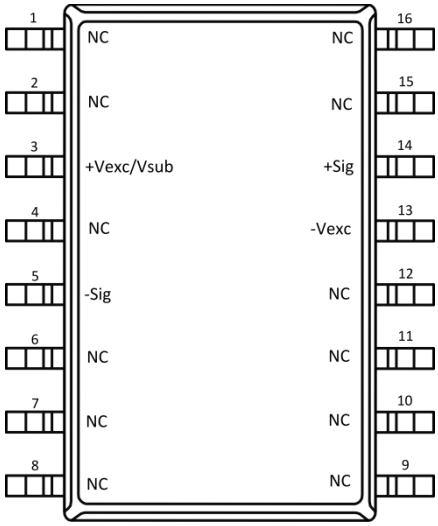


Typical Operation			
Pin	**Description**	**Type**	**Value**
3	+Vexc/Vsub	Power	Up to 5 V
5	-Sig	Analog Out	-
13	-Vexc	Power	Ground
14	+Sig	Analog Out	-

Notes:

- Do not connect to NC pins
- Applies dual ported vertical and horizontal packages
- Positive pressure applied to the topside of the die [T] is resulting in a positive change in output.

SM9G Package Pin-Out (Single Vertical)



Typical Operation			
Pin	**Description**	**Type**	**Value**
3	+Vexc/Vsub	Power	Up to 5 V
5	+Sig	Analog Out	-
13	-Vexc	Power	Ground
14	-Sig	Analog Out	-

Notes:

- Do not connect to NC pins
- Applies dual ported vertical and horizontal packages
- Positive pressure applied to the port results in a positive change in output. Pressure is applied to the backside of the die.

4. Ordering Information

Order Code	Pressure Type	Full-Scale Pressure Range	Cap Configuration	Shipping Configuration[(a)]
SM9D-BCK-T-001S-000	Differential	0.15 PSI	Dual Vertical	Tape & Reel 350 devices per reel
SM9D-BCK-T-006S-000		0.60 PSI		
SM9D-BCK-T-015S-000		1.50 PSI		
SM9D-BBK-T-001S-000	Differential	0.15 PSI	Dual Horizontal	Tape & Reel 500 devices per reel
SM9D-BBK-T-006S-000		0.60 PSI		
SM9D-BBK-T-015S-000		1.50 PSI		
SM9G-BGK-T-001S-000	Gage	0.15 PSI	Single Vertical	Tape & Reel 400 devices per reel
SM9G-BGK-T-006S-000		0.60 PSI		
SM9G-BGK-T-015S-000		1.50 PSI		

Notes:

a) All parts also available in shipping configuration Sticks, see section 5. Part Numbering Key for ordering information.

5. Part Numbering Key

Part Number

SM – XX XXX X XXX 0 0 0

Series

9	Uncompensated Low Pressure

Pressure Type

G	Gage
D	Differential

Package Type and Porting

BB	S0-16 Dual Horizontal
BC	S0-16 Dual Vertical
BK	S0-16 Single Vertical

Counter

Pressure Range

Shipping Format

S	Stick
T	Tape & Reel

Operating Temperature Range

K	-40 to +85°C